

題名:Hypoxia and Reoxygenation of the Lung Tissues Induced mRNA

作者:蘇千玲

Shen CY; Lee JF; Su CL; Wang D; Chen CF;

貢獻者:呼吸治療學系

上傳時間:2009-08-24T03:32:06Z

摘要:OBJECTIVE: Hypoxic pulmonary vasoconstriction (HPV) is a well-known phenomenon to temporarily offset a ventilation/perfusion mismatch. Sustained HPV may lead to pulmonary hypertension. In this protocol, we studied the relationships between the HPV response and oxygen radical release after hypoxia/reoxygenation (H/R) challenge in an isolated perfused lung model. MATERIALS AND METHODS: We used an in situ isolated rat lung preparation. Two hypoxic challenges (5% CO₂-95% N₂) were administered for 10 minutes each with administration of antioxidants of superoxide dismutase (SOD; 2 mg/kg), catalase (20,000 IU/kg), dimethylthiourea (DMTU; 100 mg/kg), dimethylsulfoxide (DMSO; 1 mL/kg), or allopurinol (30 mg/kg) between 2 challenges. We measured pulmonary arterial pressure changes before, during, and after H/R challenge. We measured blood concentration changes in hydroxyl radicals and nitric oxide (NO) before and after H/R. mRNA expressions of SOD and catalase in lung tissue were measured after the experiments. RESULTS: Hypoxia induced pulmonary vasoconstriction by increasing pulmonary arterial pressure and consecutive hypoxic challenges did not show tachyphylaxis. Blood concentrations of hydroxyl radicals and NO increased significantly after H/R challenges. mRNA expressions of SOD and catalase increased significantly, however, neither SOD nor catalase showed attenuated effects on HPV responses. Small molecules of DMTU, DMSO, and allopurinol attenuated the HPV responses. CONCLUSIONS: H/R induced increases in the expressions of SOD and catalase in lung tissues. DMTU, DMSO, and allopurinol antioxidants attenuated the HPV

responses by reducing the oxygen radical release.